Cisco Catalyst 3560-E Series Switches

Cisco® Catalyst® 3560-E Series is (Figure 1) an enterprise-class line of standalone access and aggregation switches that facilitate the deployment of secure converged applications while maximizing investment protection for evolving network and application requirements. Combining 10/100/1000 and Power over Ethernet (PoE) configurations with 10 Gigabit Ethernet uplinks, the Cisco Catalyst 3560-E Series access switches enhance worker productivity by enabling applications such as IP telephony, wireless, and video. Cisco Catalyst 3560-E Series aggregation switches deliver secure nonstop unified network services and versatile connectivity in a one rack-unit (1-RU) form factor for space and power constrained environments, enabling businesses to reduce total cost of ownership while maximizing investment protection.

Cisco Catalyst 3560-E Series Primary Features

- Cisco TwinGig converter module for migrating uplinks from Gigabit Ethernet to 10 Gigabit Ethernet
- Cisco EnergyWise for greenhouse gas emissions and operational cost optimization by measuring, reporting, and reducing energy consumption across the entire corporate infrastructure, well beyond the scope of IT.
- PoE configurations with 15.4W of PoE on all 48 ports
- Enhanced PoE supporting up to 20W of PoE per port
- Industry first portfolio to scale beyond 15.4W per port delivering maximum solution simplicity for 802.11n access point deployments
- Access switch models have modular fan and power supply with externally available backup
- Dual redundant modular power supplies and fans for Cisco Catalyst 3560E-12D and Catalyst 3560E-12SD aggregation switches for nonstop operation
- Multicast routing, IPv6 routing, and access control list (ACL) in hardware
- Out-of-band Ethernet management port along with RS-232 console port

Figure 1. Cisco Catalyst 3560-E Series Access and Aggregation Switches

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Switch Configurations

Table 1 shows the Cisco Catalyst 3560-E Series configurations:

Table 1. Switch Configurations.

Feature	Description
Cisco Catalyst 3560E-24TD	24 Ethernet 10/100/1000 ports and 2 X2 10 Gigabit Ethernet uplinks
Cisco Catalyst 3560E-24PD	24 Ethernet 10/100/1000 ports with PoE and 2 X2 10 Gigabit Ethernet uplinks
Cisco Catalyst 3560E-48TD	48 Ethernet 10/100/1000 ports and 2 X2 10 Gigabit Ethernet uplinks
Cisco Catalyst 3560E-48PD	48 Ethernet 10/100/1000 ports with PoE and 2 X2 10 Gigabit Ethernet uplinks
Cisco Catalyst 3560E-48PD-F	48 Ethernet 10/100/1000 ports with 15.4W PoE on all 48 ports and 2 X2 10 Gigabit Ethernet uplinks
Cisco Catalyst 3560E-12D	12 X2 10 Gigabit Ethernet ports
Cisco Catalyst 3560E-12SD	12 SFP Gigabit Ethernet ports and 2 X2 10 Gigabit Ethernet ports

Cisco Catalyst 3560-E Series Fixed Configuration Aggregation Switches

The Cisco Catalyst 3560E-12D, a 12-port 10 Gigabit Ethernet switch, and the Cisco Catalyst 3560E-12SD, a 12-port SFP Gigabit Ethernet switch with 2 10 Gigabit Ethernet uplink ports offer flexible and highly available aggregation solutions for nonstop unified network services. Dynamic routing, dual hot-swappable power supplies, and redundant field-replaceable fans enhance switch availability. Compatibility with the Cisco TwinGig module makes the Cisco Catalyst 3560-E Series aggregation switches ideal solutions for networks undergoing a gradual upgrade from Gigabit Ethernet to 10 Gigabit Ethernet. This future-proofs the network for forthcoming business growth while reducing the total cost of ownership.

The Cisco Catalyst 3560E-12D and Catalyst 3560E-12D are well suited for space- and power-constrained deployments because of the compact 1RU form factor, economical power needs and efficient cooling. Ideally suited to support secure converged applications such as Cisco TelePresence and unified communications, the Cisco Catalyst 3560E-12D and Catalyst 3560E-12SD deliver high-performance intelligent switching with the robust feature set.

Figure 2. Cisco Catalyst 3560E-12D and Cisco Catalyst 3560E-12SD Switch (Back)

Cisco Catalyst 3560-E Software

The Cisco Catalyst 3560-E Series is available with either the IP Base or the IP Services feature set. The IP Base feature set includes advanced quality of service (QoS), rate-limiting, ACLs, and basic static and Routing Information Protocol (RIP) routing capability. The IP Services feature set provides a richer set of enterprise-class features, including advanced hardware-based IP unicast and multicast routing -- Enhanced Interior Gateway Routing Protocol [EIGRP], Open Shortest Path

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First [OSPF], Border Gateway Protocol [BGP], Protocol Independent Multicast [PIM] and IPv6 routing such as OSPFv3 and EIGRPv6

Customers can transparently upgrade the software feature set in the Cisco Catalyst 3560-E Series Switches through Cisco IOS® Software Activation. Software activation authorizes and enables the Cisco IOS Software feature sets. A special file contained in the switch, called a license file, is examined by Cisco IOS Software when the switch is powered on. Based on the license's type, Cisco IOS Software activates the appropriate feature set. License types can be changed or upgraded to activate a different feature set. For detailed information about Software Activation, visit http://www.cisco.com/go/sa.

Cisco EnergyWise Technology

Cisco EnergyWise is an innovative architecture, added to the Cisco Catalyst 3560-E switches, promoting companywide sustainability by reducing energy consumption across an entire corporate infrastructure and affecting more than 50 percent of global GhG emissions created by worldwide building infrastructure, a much greater effect than the 2 percent generated by the IT industry. Cisco EnergyWise enables companies to measure the power consumption of network infrastructure and network-attached devices and manage power consumption with specific policies, reducing power consumption to realize increased cost savings, potentially affecting any powered device.

EnergyWise encompasses a highly intelligent network-based approach to communicate messages that measure and control energy between network devices and endpoints. The network discovers Cisco EnergyWise manageable devices, monitors their power consumption, and takes action based on business rules to reduce power consumption. EnergyWise uses a unique domain-naming system to query and summarize information from large sets of devices, making it simpler than traditional network management capabilities. Cisco EnergyWise's management interfaces allow facilities and network management applications to communicate with endpoints and each other using the network as a unifying fabric. The management interface uses standard SNMP or SSL to integrate Cisco and third-party management systems.

Cisco EnergyWise extends the network as a platform for power control plane for gathering, managing, and reducing power consumption of all devices, resulting in companywide optimized power delivery and reduced energy costs.

10 Gigabit Ethernet Uplinks and the Cisco TwinGig Small Form-Factor Pluggable Converter

The Cisco Catalyst 3560-E features wire-speed 10 Gigabit Ethernet uplink ports for high-bandwidth applications relieving congestion and helping ensure smooth delivery of data. The TwinGig converter (see Figure 3) converts a 10 Gigabit Ethernet X2 interface into two Gigabit Ethernet Small Form-Factor Pluggable (SFP) ports. This way, customers can initially use the switch with Gigabit Ethernet uplinks and later implement 10 Gigabit Ethernet uplinks as business demands change, without having to upgrade the access layer.

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Figure 3. Cisco TwinGig Adapter Converting 10 Gigabit Ethernet X2 Interface into Two Gigabit Ethernet SFP Interfaces

Modular Power Supplies

The Cisco Catalyst 3560-E Series access switches have one power supply slot and support the following power supplies. PoE switches require a PoE power supply. Data-only switches can operate with any of the power supplies:

- C3K-PWR-1150WAC: 1150WAC power supply with 800W PoE
- C3K-PWR-750WAC: 750WAC power supply for 24-port switch with 420W PoE
- C3K-PWR-265WAC: 265WAC power supply for 48- or 24-port switch without PoE
- C3K-PWR-265WDC: 265WDC power supply for 48- or 24-port switch without PoE

Maximum power availability for converged voice and data networks is attainable when a Cisco Catalyst 3560-E Series Switch is combined with the Cisco Redundant Power System 2300 (Cisco RPS 2300) for transparent protection against internal power supply failures and an uninterruptible power supply (UPS) system to safeguard against power outages. Using the Cisco RPS 2300 to provide backup power, the Cisco Catalyst 3560-E Series Switch power supplies become hot swappable. Table 4 shows the power supply compatibility matrix.

The Cisco Catalyst 3560E-12D and the Cisco Catalyst 3560E-12SD aggregation switches have dual redundant power supplies that can be replaced, one at a time, without service interruption. Customers can choose from AC, DC, and mixed power supply options:

- C3K-PWR-300WAC: Cisco Catalyst 3560E-12D and 3560E-12SD 300WAC power supply
- C3K-PWR-300WDC: Cisco Catalyst 3560E-12D and 3560E-12SD 300WDC power supply

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Power over Ethernet

The Cisco Catalyst 3560-E Series can provide a lower total cost of ownership for deployments that incorporate Cisco IP phones, Cisco Aironet® wireless LAN (WLAN) access points, or any IEEE 802.3af-compliant end device. PoE removes the need for wall power to each PoE-enabled device and eliminates the cost for additional electrical cabling and circuits that would otherwise be necessary in IP phone and WLAN deployments. The Cisco Catalyst 3560-E 24-port PoE configurations can support 24 simultaneous full-powered PoE ports at 15.4W for full powered-device support. The Cisco Catalyst 3560-E 48-port PoE configurations can support 48 simultaneous full-powered PoE ports at 15.4W when using the optional 1150W power supply. Alternatively, for deployments that do not need full PoE on all ports, a smaller power supply can be used in conjunction with Cisco Catalyst Intelligent Power Management to support 24-port and 48-port PoE configurations.

The Cisco Catalyst 3560-E Series also features Enhanced Power over Ethernet support, the capability to power a growing number of devices from a single switch port, enabling greater operational simplicity and flexibility for secure converged networks. Industry first portfolio to scale beyond 15.4W per port delivering maximum solution simplicity for 802.11n access point deployments, as well as other PoE-powered devices such as phones, monitors, digital signs, medical devices, card readers and more.

Redundant Power System

The Cisco Catalyst 3560-E Series access switches support the new generation of Cisco RPS 2300, which increases availability in a converged data, voice, and video network by providing transparent power backup to two of six attached Cisco Catalyst 3560-E Series Switches at the same time. The failed power supply can be swapped out while the switch is being powered up by the Cisco RPS 2300. The Cisco Catalyst 3560E-12D and 3560E-12SD aggregation switches don't support the RPS, they provide redundancy and switch uptime with dual redundant modular power supplies.

Primary Features and Benefits

Ease of Use: Deployment

The Cisco Catalyst 3560-E offers ease of use features such as Cisco Smartports, which enable fast and easy configuration of advanced Cisco Catalyst intelligent capabilities, encapsulating years of Cisco networking expertise. Cisco Smartports macros offer a set of verified feature templates per connection type that are easy to apply, enabling users to consistently and reliably configure essential security, IP telephony, availability, QoS, and manageability features with minimal effort and expertise.

Other ease of use features include:

- Dynamic Host Configuration Protocol (DHCP) autoconfiguration of multiple switches through a boot server eases switch deployment.
- Automatic QoS (AutoQoS) simplifies QoS configuration in voice-over-IP (VoIP) networks by issuing interface and global switch commands to detect Cisco IP phones, classify traffic, and help enable egress queue configuration.
- Autonegotiation on all ports automatically selects half- or full-duplex transmission mode to optimize bandwidth.
- Dynamic Trunking Protocol (DTP) facilitates dynamic trunk configuration across all switch ports.

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- Port Aggregation Protocol (PAgP) automates the creation of Cisco Fast EtherChannel® groups or Gigabit EtherChannel groups to link to another switch, router, or server.
- Link Aggregation Control Protocol (LACP) allows the creation of Ethernet channeling with devices that conform to IEEE 802.3ad. This feature is similar to Cisco EtherChannel technology and PAgP.
- Automatic media-dependent interface crossover (MDIX) automatically adjusts transmit and receive pairs if an incorrect cable type (crossover or straight-through) is installed.
- Unidirectional Link Detection Protocol (UDLD) and Aggressive UDLD allow unidirectional links caused by incorrect fiber-optic wiring or port faults to be detected and disabled on fiber-optic interfaces.

Availability and Scalability

The Cisco Catalyst 3560-E Series is equipped with a robust set of features that allow for network scalability and higher availability. This is achieved through IP routing as well as a complete suite of Spanning Tree Protocol enhancements aimed to maximize availability in a Layer 2 network. Enhancements to the standard Spanning Tree Protocol, such as Per-VLAN Spanning Tree Plus (PVST+), Uplink Fast, and Port Fast, as well as innovations such as Flexlink, maximize network uptime.

- Flexlink provides link redundancy with convergence time less than 100ms without Spanning Tree Protocol. A pair of interfaces configured as primary and backup links can load balance traffic based on VLAN. IEEE 802.1s/w Rapid Spanning Tree Protocol (RSTP) and Multiple Spanning Tree Protocol (MSTP) provide rapid spanning-tree convergence independent of spanning-tree timers and also offer the benefit of Layer 2 load balancing and distributed processing.
- Per-VLAN Rapid Spanning Tree (PVRST+) allows rapid spanning-tree reconvergence on a per-VLAN spanning-tree basis, without requiring the implementation of spanning-tree instances.
- Cisco Hot Standby Router Protocol (HSRP) is supported to create redundant, failsafe routing topologies.
- Switch-port Autorecovery (Errdisable) automatically attempts to reactivate a link that is disabled because of a network error.

High-Performance IP Routing

Cisco Express Forwarding hardware routing architecture delivers extremely high-performance IP routing in the Cisco Catalyst 3560-E Series Switches.

- Basic IP unicast routing protocols (Static, Routing Information Protocol Version 1 [RIPv1], and RIPv2, RIPng, EIGRP stub) are supported for small-network routing applications.
- Advanced IP unicast routing protocols (OSPF, EIGRP, and BGPv4) are supported for load balancing and constructing scalable LANs. IPv6 routing (OSPFv3 and EIGRPv6) is supported in hardware for maximum performance. The IP Services feature set is required.
- Equal-cost routing facilitates Layer 3 load balancing and redundancy.
- Policy-based routing (PBR) allows superior control by facilitating flow redirection regardless of the routing protocol configured. The IP Services feature set is required.

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- HSRP provides dynamic load balancing and failover for routed links, up to 32 unique HSRP links supported per unit. The group number can be reused for each VLAN configured in the switch.
- Protocol Independent Multicast (PIM) for IP multicast routing is supported, including PIM sparse mode (PIM-SM), Source Specific Multicast (SSM), PIM dense mode (PIM-DM), PIM sparse-dense mode and Source Specific Multicast (SSM). The IP Services feature set is required.
- Web Control Caching Protocol (WCCPv2) enables Wide Area Acceleration Services (WAAS), resulting in improved application response time and conservation of WAN bandwidth.
- Fallback bridging forwards non-IP traffic between two or more VLANs. The IP Services feature set is required.

Superior Quality of Service

The Cisco Catalyst 3560-E Series offers Gigabit Ethernet speed with intelligent services that keep everything flowing smoothly, even at 10 times the normal network speed. Industry-leading mechanisms for marking, classification, and scheduling deliver superior performance for data, voice, and video traffic, all at wire speed.

Following are some of the QoS features supported in the Cisco Catalyst 3560-E Series Switches:

- 802.1p class of service (CoS) and differentiated services code point (DSCP) field classification is provided, using marking and reclassification on a per-packet basis by source and destination IP address, MAC address, or Layer 4 TCP/UDP port number.
- Cisco control-plane and data-plane QoS ACLs on all ports help ensure proper marking on a per-packet basis.
- Four egress queues per port help enable differentiated management of up to four traffic types across the switch.
- Shaped Round Robin (SRR) scheduling helps ensure differential prioritization of packet flows by intelligently servicing the ingress queues and egress queues.
- Weighted Tail Drop (WTD) provides congestion avoidance at the ingress and egress queues before a disruption occurs.
- Strict priority queuing helps ensure that the highest-priority packets are serviced ahead of all other traffic.
- The Cisco committed information rate (CIR) function provides bandwidth in increments as low as 8 Kbps.
- Rate limiting is provided based on source and destination IP address, source and destination MAC address, Layer 4 TCP/UDP information, or any combination of these fields, using QoS ACLs (IP ACLs or MAC ACLs), class maps, and policy maps.
- Up to 64 aggregate or individual policers are available per Fast Ethernet or Gigabit Ethernet port.

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Advanced Security

The Cisco Catalyst 3560-E Series supports a comprehensive set of security features for connectivity and access control, including ACLs, authentication, port-level security, and identity-based network services with 802.1x and extensions. This set of comprehensive features not only helps prevent external attacks, but defends the network against “man-in-the-middle” attacks, a primary concern in today’s business environment. The switch also supports the Network Admission Control (NAC) security framework.

- DHCP Snooping prevents malicious users from spoofing a DHCP server and sending out invalid addresses. This feature is used by other primary security features to prevent a number of other attacks such as ARP poisoning.
- Dynamic ARP Inspection (DAI) helps ensure user integrity by preventing malicious users from exploiting the insecure nature of the ARP protocol.
- IP source guard prevents a malicious user from spoofing or taking over another user’s IP address by creating a binding table between the client’s IP and MAC address, port, and VLAN.
- Private VLANs restrict traffic between hosts in a common segment by segregating traffic at Layer 2, turning a broadcast segment into a nonbroadcast multi-access-like segment.
- Private VLAN Edge provides security and isolation between switch ports, which helps ensure that users cannot snoop on other users’ traffic.
- Unicast RPF feature helps mitigate problems caused by the introduction of malformed or forged (spoofed) IP source addresses into a network by discarding IP packets that lack a verifiable IP source address.
- IEEE 802.1x allows dynamic, port-based security, providing user authentication.
- IEEE 802.1x with VLAN assignment allows a dynamic VLAN assignment for a specific user regardless of where the user is connected.
- IEEE 802.1x with voice VLAN permits an IP phone to access the voice VLAN irrespective of the authorized or unauthorized state of the port.
- IEEE 802.1x and port security are provided to authenticate the port and manage network access for all MAC addresses, including that of the client.
- IEEE 802.1x with an ACL assignment allows for specific identity-based security policies regardless of where the user is connected.
- IEEE 802.1x with guest VLAN allows guests without 802.1x clients to have limited network access on the guest VLAN.
- Web authentication for non-802.1x clients allows non-802.1x clients to use an SSL-based browser for authentication.
- Multi-Domain Authentication allows an IP phone and a PC to authenticate on the same switch port while placing them on appropriate voice and data VLANs.
- MAC Auth Bypass (MAB) for voice allows third-party IP phones without an 802.1x supplicant to get authenticated using their MAC address.
- Cisco security VLAN ACLs on all VLANs prevent unauthorized data flows from being bridged within VLANs.
- Cisco standard and extended IP security router ACLs define security policies on routed interfaces for control-plane and data-plane traffic. IPv6 ACLs can be applied to filter IPv6 traffic.

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- Port-based ACLs for Layer 2 interfaces allow security policies to be applied on individual switch ports.
- Secure Shell (SSH) Protocol, Kerberos, and Simple Network Management Protocol Version 3 (SNMPv3) provide network security by encrypting administrator traffic during Telnet and SNMP sessions. SSH Protocol, Kerberos, and the cryptographic version of SNMPv3 require a special cryptographic software image because of U.S. export restrictions.
- Bidirectional data support on the Switched Port Analyzer (SPAN) port allows the Cisco intrusion detection system (IDS) to take action when an intruder is detected.
- TACACS+ and RADIUS authentication facilitates centralized control of the switch and restricts unauthorized users from altering the configuration.
- MAC Address Notification allows administrators to be notified of users added to or removed from the network.
- Port Security secures the access to an access or trunk port based on MAC address.
- Multilevel security on console access prevents unauthorized users from altering the switch configuration.
- Bridge protocol data unit (BPDU) guard shuts down Spanning Tree PortFast-enabled interfaces when BPDUs are received to avoid accidental topology loops.
- Spanning Tree Root Guard (STRG) prevents edge devices not in the network administrator's control from becoming Spanning Tree Protocol root nodes.
- IGMP filtering provides multicast authentication by filtering out nonsubscribers and limits the number of concurrent multicast streams available per port.
- Dynamic VLAN assignment is supported through implementation of VLAN Membership Policy Server client capability to provide flexibility in assigning ports to VLANs. Dynamic VLAN facilitates the fast assignment of IP addresses.

Intelligent Power over Ethernet (PoE) Management

The Cisco Catalyst 3560-E PoE models support Cisco IP phones and Cisco Aironet wireless LAN (WLAN) access points, as well as any IEEE 802.3af-compliant end device. The Cisco Catalyst 3560-E-48PD can support 48 simultaneous full-powered PoE ports at 15.4W with the 1150W power supply.

- Cisco Discovery Protocol version 2 allows the Cisco Catalyst 3560-E Series Switch to negotiate a more granular power setting when connecting to a Cisco powered device, such as IP phones or access points, than what is provided by IEEE classification.
- Per Port power consumption command allows customer to specify maximum power setting on an individual port.
- Per Port PoE Power Sensing measures actual power being drawn, enabling more intelligent control of powered devices.
- The PoE MIB provides proactive visibility into power usage and allows customers to set different power level thresholds
- Link Layer Discovery Protocol (LLDP and LLDP-MED) adds support for IEEE 802.1AB link layer discovery protocol for interoperability in multivendor networks. Switches exchange speed, duplex, and power settings with end devices such as IP phones.

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Management and Control Features

The Cisco Catalyst 3560-E Series Switches come with a rich set of management and control features that include:

- Cisco IOS Software CLI support provides common user interface and command set with all Cisco routers and Cisco Catalyst desktop switches.
- Generic On-Line Diagnostics (GOLD) checks the health of hardware components and verifies proper operation of the system data and control plane at run time and boot time.
- Virtual Route Forwarding (VRF)-Lite enables a service provider to support two or more VPNs with overlapping IP addresses.
- Switching Database Manager Templates for access, routing, and VLAN deployment allow the administrator to easily maximize memory allocation to the desired features based on deployment-specific requirements.
- With Cisco IOS Software IP SLAs, users can verify service guarantees, increase network reliability by validating network performance, proactively identify network issues, and increase return on investment (ROI) by easing the deployment of new IP services.
- Local Proxy Address Resolution Protocol (ARP) works in conjunction with Private VLAN Edge to minimize broadcasts and maximize available bandwidth.
- VLAN1 minimization allows VLAN1 to be disabled on any individual VLAN trunk.
- Internet Group Management Protocol (IGMP) Snooping for IPv4 and IPv6 MLD v1 and v2 Snooping provide fast client joins and leaves of multicast streams and limit bandwidth-intensive video traffic to only the requestors.
- Multicast VLAN Registration (MVR) continuously sends multicast streams in a multicast VLAN while isolating the streams from subscriber VLANs for bandwidth and security reasons.
- Per-port broadcast, multicast, and unicast storm control prevents faulty end stations from degrading overall systems performance.
- Voice VLAN simplifies telephony installations by keeping voice traffic on a separate VLAN for easier administration and troubleshooting.
- Cisco VLAN Trunking Protocol (VTP) supports dynamic VLANs and dynamic trunk configuration across all switches.
- Remote Switch Port Analyzer (RSPAN) allows administrators to remotely monitor ports in a Layer 2 switch network from any other switch in the same network.
- For enhanced traffic management, monitoring, and analysis, the Embedded Remote Monitoring (RMON) software agent supports four RMON groups (history, statistics, alarms, and events).
- Layer 2 traceroute eases troubleshooting by identifying the physical path that a packet takes from source to destination.
- Trivial File Transfer Protocol (TFTP) reduces the cost of administering software upgrades by downloading from a centralized location.
- Network Timing Protocol (NTP) provides an accurate and consistent timestamp to all intranet switches.

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- Multifunction LEDs per port for port status; half-duplex and full-duplex mode; and 10BASE-T, 100BASE-TX, and 1000BASE-T indication as well as switch-level status LEDs for system, redundant-power supply, and bandwidth utilization provide a comprehensive and convenient visual management system.
- Jumbo frames (9216 bytes) are available on the 10/100/1000 configurations for advanced data and video applications requiring very large frames.

Network Management Tools

The Cisco Catalyst 3560-E Series offers both a superior command-line interface (CLI) for detailed configuration and Cisco Network Assistant software, a PC-based tool for quick configuration based on preset templates. In addition, CiscoWorks LAN Management Solution (LMS) supports the Cisco Catalyst 3560-E Series for networkwide management.

Cisco Network Assistant

A PC-based network management application designed for small and medium-sized business (SMB) networks with up to 250 users, Cisco Network Assistant offers centralized network management and configuration capabilities. Cisco Network Assistant uses Cisco Smartports technology to simplify both initial deployment and ongoing maintenance. This application also features an intuitive GUI where users can easily apply common services across Cisco switches, routers, and access points, such as:

- Configuration management
- Troubleshooting advice
- Inventory reports
- Event notification
- Network security settings
- Password synchronization
- Drag-and-drop Cisco IOS Software upgrades
- Secure wireless

For detailed information about Cisco Network Assistant, go to: http://www.cisco.com/go/cna.

CiscoWorks LAN Management Solution (LMS)

CiscoWorks LMS is a suite of powerful management tools that simplify the configuration, administration, monitoring, and troubleshooting of Cisco networks. It integrates these capabilities into a world-class solution for improving the accuracy and efficiency of your operations staff, while increasing the overall availability of your network. LMS supports over 400 different device types, including the Cisco Catalyst 3560-E Series Switches, and it provides:

- Network discovery, topology views, end-station tracking, and VLAN management
- Real-time network fault analysis with easy-to-deploy device-specific best-practice templates
- Hardware and software inventory management, centralized configuration tools, and Syslog monitoring
- Network response time and availability monitoring and tracking
- Real-time device, link, and port traffic management, analysis, and reporting

For detailed information about CiscoWorks LMS, go to:
http://www.cisco.com/en/US/products/sw/cscowork/ps2425/index.html.

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Cisco Catalyst 3560 SFP Interconnect Cable

The Cisco Catalyst 3560 SFP Interconnect Cable (see Figure 4) provides for a low-cost point-to-point Gigabit Ethernet connection between Cisco Catalyst 3560 switches. The 50cm cable is an alternative to using SFP transceivers when interconnecting Cisco Catalyst 3560 switches through their SFP ports over a short distance.

Figure 4. Cisco Catalyst 3560 SFP Interconnect Cable

Product Specifications

Table 2 lists product specifications for the Cisco Catalyst 3560-E Series.

Table 2. Descriptions and Specifications

Description	Specification				
Performance	Switching Fabric	128 Gbps			
	DRAM	128 MB / 256 MB *			
	FLASH	64 MB			
	VLANs	1K			
	VLAN IDs	4K			
	Switched Virtual Interfaces (SVIs)	1K			
	Jumbo Frames	9216 Byte			
	Forwarding rate:				
	3560E-24TD	65.5 Mpps			
	3560E-24PD	65.5 Mpps			
	3560E-48TD	101.2 Mpps			
	3560E-48PD	101.2 Mpps			
	3560E-48PD-F	101.2 Mpps			
	3560E-12D	90 Mpps			
	3560E-12SD	47.6 Mpps			
	MAC, routing, security, and QoS scalability numbers depend on the type of template used in the switch:				
	Default Template	**Access Template**	**VLAN Template**	**Routing Template**	**Default Template**
	MAC address	6K	4K / 6K *	12K	3K / 6K *
	IGMP groups and multicast routes	1K	1K	1K	1K

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	Total unicast routes	8K / 12K *	6K / 12K *	0	11K / 20K *
	Directly connected hosts	6K	4K / 6K *	0	3K / 6K *
	Indirect routes	2K / 6K *	2K / 6K *	0	8K / 14K *
	Security ACEs	1K	2K / 4K *	1K	1K
	QoS ACEs	0.5K / 0.8K *	0.5K / 0.8K *	0.5K / 0.8K *	0.5K
	PBR ACEs	0	0.5K	0	0.5K
	* Specific to the Cisco Catalyst 3560E-12D only				
Connectors and Cabling	• 1000BASE-T ports: RJ-45 connectors, 2-pair Cat-5 UTP cabling • 1000BASE-T SFP-based ports: RJ-45 connectors, 2-pair Cat-5 UTP cabling • 100BASE-FX, 1000BASE-SX, -LX/LH, -ZX, -BX10 and CWDM SFP-based ports: LC fiber connectors (single-mode, or multimode fiber) • 10GBASE-SR, LR, ER, CX4, LX4, LRM X2-based ports: SC fiber connectors (single-mode, or multimode fiber) • Ethernet management port: RJ-45 connectors, 2-pair Cat-5 UTP cabling • Management console port: RJ-45-to-DB9 cable for PC connections				
Power Connectors	• Customers can provide power to an access switch by using either the internal power supply or the Cisco RPS 2300. The connectors are located at the back of the switch. • The Cisco Catalyst 3560E-12D and Catalyst 3560E-12SD have dual power supplies and do not support the RPS. • Internal power supply connector: The internal power supply is an autoranging unit. The internal power supply supports input voltages between 100 and 240VAC. Use the supplied AC power cord to connect the AC power connector to an AC power outlet. • Cisco RPS connector: The connector offers connection for an optional Cisco RPS 2300 that uses AC input and supplies DC output to the switch. • Only the Cisco RPS 2300 (model PWR-RPS2300) should be attached to the redundant-power-supply receptacle.				
Indicators	• Per-port status LEDs: link integrity, disabled, activity, speed, and full-duplex indications • System-status LEDs: system, RPS, and bandwidth-utilization indications (on the Cisco Catalyst 3560E-12D and 3560E-12SD only: system, power supplies, fans)				
Dimensions (H x W x D)		**Inches**	**Centimeters**		
	3560E-24TD	1.75 x 17.5 x 18.1	4.45 x 44.5 x 46.0		
	3560E-24PD	1.75 x 17.5 x 18.1	4.45 x 44.5 x 46.0		
	3560E-48TD	1.75 x 17.5 x 18.1	4.45 x 44.5 x 46.0		
	3560E-48PD	1.75 x 17.5 x 18.1	4.45 x 44.5 x 46.0		
	3560E-48PD-F	1.75 x 17.5 x 21.7	4.45 x 44.5 x 55.2		
	3560E-12D	1.75 x 17.5 x 19.5	4.45 x 44.5 x 49.5		
	3560E-12SD	1.75 x 17.5 x 15	4.45 x 44.5 x 38.1		
Weight		**Pounds**	**Kilograms**		
	3560E-24TD	17.9	8.1		
	3560E-24PD	18.3	8.3		
	3560E-48TD	18.8	8.6		
	3560E-48PD	19.2	8.75		
	3560E-48PD-F	20.9	9.5		
	3560E-12D	23.5	10.7		
	3560E-12SD	16	7.27		
Environmental Ranges	• Operating temperature: 32 to 113ºF (0 to 45ºC) • Storage temperature: –13 to 158ºF (–25 to 70ºC) • Relative humidity operating: 0 to 95% (noncondensing) • Relative humidity nonoperating: 10 to 85% (noncondensing) • Operating altitude: up to 10,000 ft (3049 m) • Storage altitude: up to 15,000 ft (4573 m) • Cisco Catalyst 3560E-12D and Catalyst 3560E-12SD: up to 50,000 feet over allowable temperature range; NEBS - up to 13,000 feet [4000 m]				

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Acoustic Noise	International Organization for Standardization (ISO) 7779: bystander position operating to an ambient temperature of 30ºC	
	3560E-24TD	45 dB
	3560E-48TD	45 dB
	3560E-24PD	45 dB
	3560E-48PD	45 dB
	3560E-48PD-F	48 dB
	3560E-12D	44 dB
	3560E-12SD	44 dB
Mean Time Between Failure (MTBF)	3560E-24TD	181,086 hours
	3560E-24PD	168,753 hours
	3560E-48TD	166,907 hours
	3560E-48PD	151,196 hours
	3560E-48PD-F	151,196 hours
	3560E-12D	147,001 hours
	3560E-12SD	206,950 hours

Table 3 lists the management and standards support for the Cisco Catalyst 3560-E Series.

Table 3. Management and Standards Support for Cisco Catalyst 3560-E Series Switches

Description	Specification	
Management	• BRIDGE-MIB • CISCO-CDP-MIB • CISCO-CLUSTER-MIB • CISCO-CONFIG-MAN-MIB • CISCO-ENTITY-FRU-CONTROL-MIB • CISCO-ENVMON-MIB • CISCO-FLASH-MIB • CISCO-FTP-CLIENT-MIB • CISCO-HSRP-MIB • CISCO-HSRP-EXT-MIB • CISCO-IGMP-FILTER-MIB • CISCO-IMAGE-MIB • CISCO-IP-STAT-MIB • CISCO-L2L3-INTERFACE-CONFIG-MIB • CISCO-POE-EXTENSIONS-MIB • CISCO-MAC-NOTIFICATION-MIB • CISCO-MEMORY-POOL-MIB • CISCO-PAGP-MIB • CISCO-PING-MIB • CISCO-PROCESS-MIB • CISCO-RTTMON-MIB • CISCO-STP-EXTENSIONS-MIB • CISCO-SYSLOG-MIB • CISCO-TCP-MIB • CISCO-VLAN-IFTABLE-RELATIONSHIP-MIB • CISCO-VLAN-MEMBERSHIP-MIB	• CISCO-VTP-MIB • ENTITY-MIB • ETHERLIKE-MIB • IF-MIB • IGMP-MIB • IPMROUTE-MIB • OLD-CISCO-CHASSIS-MIB • OLD-CISCO-FLASH-MIB • OLD-CISCO-INTERFACES-MIB • OLD-CISCO-IP-MIB • OLD-CISCO-SYS-MIB • OLD-CISCO-TCP-MIB • OLD-CISCO-TS-MIB • OSPF-MIB (RFC 1253) • PIM-MIB • RFC1213-MIB • RFC1253-MIB • RMON-MIB • RMON2-MIB • SNMP-FRAMEWORK-MIB • SNMP-MPD-MIB • SNMP-NOTIFICATION-MIB • SNMP-TARGET-MIB • SNMPv2-MIB • TCP-MIB • UDP-MIB

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Standards	• IEEE 802.1s • IEEE 802.1w • IEEE 802.1x • IEEE 802.3ad • IEEE 802.3af • IEEE 802.3x full duplex on 10BASE-T, 100BASE-TX, and 1000BASE-T ports • IEEE 802.1D Spanning Tree Protocol • IEEE 802.1p CoS Prioritization • IEEE 802.1Q VLAN • IEEE 802.3 10BASE-T specification • IEEE 802.3u 100BASE-TX specification • IEEE 802.3ab 1000BASE-T specification • IEEE 802.3z 1000BASE-X specification • 100BASE-FX • 1000BASE-T • 1000BASE-SX	• 1000BASE-LX/LH • 1000BASE-BX10-U • 1000BASE-BX10-D • 1000BASE-ZX • 1000BASE-CWDM SFP 1470 nm • 1000BASE-CWDM SFP 1490 nm • 1000BASE-CWDM SFP 1510 nm • 1000BASE-CWDM SFP 1530 nm • 1000BASE-CWDM SFP 1550 nm • 1000BASE-CWDM SFP 1570 nm • 1000BASE-CWDM SFP 1590 nm • 1000BASE-CWDM SFP 1610 nm • 10GBASE-SR • 10GBASE-LR • 10GBASE-ER • RMON I and II standards • SNMPv1, SNMPv2c, and SNMPv3

Table 4 lists the power supply compatibility matrix for all different models of Cisco Catalyst 3560-E Series Switches.

Table 4. Power Supply Compatibility Matrix

Cisco Catalyst 3560-E Series Switch Type	Power Supply					
	C3K-PWR-1150WAC	**C3K-PWR-750WAC**	**C3K-PWR-265WAC**	**C3K-PWR-265WDC**	**C3K-PWR-300WAC**	**C3K-PWR-300WDC**
48-Port PoE Switch	X	X	–	–	–	–
24-Port PoE Switch	X	X	–	–	–	–
48-Port Switch	X	X	X	X	–	–
24-Port Switch	X	X	X	X	–	–
Cisco RPS 2300	X	X	–	–	–	–
Cisco Catalyst 3560E-12D	–	–	–	–	X	X
Cisco Catalyst 3560E-12SD	–	–	–	–	X	X

Table 5 lists the power specifications for the Cisco Catalyst 3560-E Series based on the kind of power supply used.

Table 5. Power Specifications

Description	Specifications					
	C3K-PWR-1150WAC	**C3K-PWR-750WAC**	**C3K-PWR-265WAC**	**C3K-PWR-265WDC**	**C3K-PWR-300WAC**	**C3K-PWR-300WDC**
Max Output Power	1150W	750W	265W	265W	300W	300W
Total Output BTU (Note: 1000 BTU/hr = 290W)	3939 BTU/hr, 1150W	2568 BTU/hr, 765W	907 BTU/hr, 265W	907 BTU/hr, 265W	1034 BTU/hr, 300W	
Input-Voltage Range and Frequency	115–240VAC, 50–60 Hz	100–240VAC, 50–60 Hz	100–240VAC, 50–60 Hz	-36VDC to -72VDC	85–265VAC, 47–63 Hz	-40.5VDC to -72VDC
Input Current	12-6A	10-5A	5-2.5A	<5A@-72VDC <10A@-36VDC	4-2A	8A
Output Ratings	12V@25A -52V@16.4A	12V@25A -52V@8.75A	12V@22A	12V@22A	12V@25A	12V@25A
Output Holdup Time	20 ms minimum	20 ms minimum	20 ms minimum	> 2ms@-48VDC	20 ms minimum	8ms

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Power-Supply Input Receptacles	IEC 320-C14 (IEC60320-C14)	IEC 320-C14 (IEC60320-C14)	IEC 320-C13 (IEC60320-C14)	–	IEC 320-C13 (IEC60320-C14)	–
Power Cord Rating	15A	15A	15A	12A@-100VDC	10A	12AWG

Description	Specifications				
	WS-C3560E-48PD-SF	**WS-C3560E-24PD-S**	**WS-C3560E-48PD-S**	**WS-C3560E-24TD-S**	**WS-C3560E-48TD-S**
	C3K-PWR-1150WAC	**C3K-PWR-750WAC**	**C3K-PWR-265WAC**	**C3K-PWR-265WDC**	**C3K-PWR-300WAC**
100% Throughput					
Measured Power Consumption	146W	89W	133W	89W	151W
Measured Output BTU/hr	498	303	451	303	514
5% Throughput					
Measured Power Consumption	137W	94W	124W	96W	141W
Measured Output BTU/hr	466	320	420	292	481
5% Throughput (with 50% PoE loads)					
Measured Power Consumption	Switch Power: 558W PoE Power: 385W	Switch Power: 297W PoE Power: 193W	Switch Power: 332W PoE Power: 196W	N/A	N/A
Measured Output BTU/hr	At the Switch: 590	At the Switch: 355	At the Switch: 464	N/A	N/A
100% Throughput (with maximum possible PoE loads)					
Measured Power Consumption	Switch Power: 972W PoE Power: 744W	Switch Power: 502W PoE Power: 372W	Switch Power: 540W PoE Power: 375W	N/A	N/A
Measured Output BTU/hr	At the Switch: 778	At the Switch: 443	At the Switch: 561	N/A	N/A

Note:

Disclaimer: All power consumption numbers were measured under controlled laboratory conditions and are provided as an estimate.

The wattage rating on the power supply does not represent actual power draw. It indicates the maximum power draw possible by the power supply. This rating can be used for facility capacity planning. For PoE switches, cooling requirements are smaller than the actual power consumption as a significant portion of PoE loads are dissipated in the end points

Non-PoE Power Consumption

100 Percent Throughput Switch Power Consumption

The numbers indicate the power consumed by a typical switch under normal conditions. Normal conditions signify a temperature of 25 degrees Celsius, atmospheric pressure in the range of 860 to 1060 mbar and relative humidity from 30 to 75 percent. Typically such power draws are only seen when encountering a 100 percent traffic load made up entirely of 64 byte packets on the switch and the uplinks.

5 Percent Throughput Switch Power Consumption

The numbers indicate the power consumed by a typical switch under normal conditions. Normal conditions signify a temperature of 25 degrees Celsius, atmospheric pressure in the range of 860

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to 1060 mbar and relative humidity from 30 to 75 percent. The numbers below indicate a 5 percent traffic load on the switch and its uplinks.

PoE Power Consumption

100 Percent Throughput Switch Power Consumption (no PoE loads)

The numbers indicate the power consumed by a typical switch under normal conditions. Normal conditions signify a temperature of 25 degrees Celsius, atmospheric pressure in the range of 860 to 1060 mbar and relative humidity from 30 to 75 percent. Typically such power draws are only seen when encountering a 100 percent traffic load made up entirely of 64 byte packets with no PoE loads on the switch and uplinks.

Measured 5 Percent Throughput Switch Power Consumption (no PoE loads)

The numbers indicate the power consumed by a typical switch under normal conditions. Normal conditions signify a temperature of 25 degrees Celsius, atmospheric pressure in the range of 860 to 1060 mbar and relative humidity from 30 to 75 percent. The numbers below indicate a 5 percent traffic load on the switch and its uplinks

100 Percent Throughput Switch Power Consumption (with maximum PoE loads)

The numbers indicate the power consumed by a typical system (the switch and the corresponding PoE loads) under normal conditions. Normal conditions signify a temperature of 25 degrees Celsius, atmospheric pressure in the range of 860 to 1060 mbar and relative humidity from 30 to 75 percent. Typically this power draw is realized when a switch is running 100 percent traffic load of 64 byte sized packets on all its ports and uplinks and also drawing 100 percent PoE load .

5 Percent Throughput Switch Power Consumption (with 50 percent PoE loads).

The numbers indicate the power consumed by a typical system (the switch and the corresponding PoE loads) under normal conditions. Normal conditions signify a temperature of 25 degrees Celsius, atmospheric pressure in the range of 860 to 1060 mbar and relative humidity from 30 to 75 percent. The numbers below indicate a 5 percent traffic load and 50 percent PoE load on the switch and its uplinks.

Table 6 lists the specifications of all the power supplies supported in Cisco Catalyst 3560-E Series Switches.

Table 6. Power Supply Specifications

Product Specifications	Power Supply					
	C3K-PWR-1150WAC	**C3K-PWR-750WAC**	**C3K-PWR-265WAC**	**C3K-PWR-265WDC**	**C3K-PWR-300WAC**	**C3K-PWR-300WDC**
Physical Specifications	(H x W x D): 1.65 X 6.0 X 14.90 in Weight: 5.6 lb (2.6 kg)	(H x W x D): 1.65 X 6.0 X 11.4 in Weight: 3.9 lb (1.8 kg)	(H x W x D): 1.65 X 6.0 X 11.4 in Weight: 3.3 lb (1.5 kg)	(H x W x D): 1.65 X 6.0 X 11.4 in Weight: 3.5 lb (1.6 kg)	(H x W x D): 1.58 X 4.0 x 9.0 in Weight: (2 Kg)	
Operating Temperature	23 to 113℉ (-5 to 45℃)				23 to 131℉ (-5 to 55℃)	
Storage Temperature	-40 to 158℉ (-40 to 70℃)				-40 to 185℉ (-40 to 85℃)	
Relative Humidity Operating	10 to 85% noncondensing				10 to 90% noncondensing	
Relative Humidity Nonoperating	0 to 95% noncondensing				5 to 95% noncondensing	

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Altitude	10,000 ft. (3000 meters), up to 45°C	Operating: -500 to 10,000 ft. (-152 to 3048 m) over allowable temperature range Nonoperating: -1,000 to 50,000 ft. (-304 to 15,240 m) over allowable temperature range	
MTBF	Calculated MTBF must be greater than 300,000 hrs using Telcordia SR-332, Method 1, Case 3. Demonstrated MTBF is 500,000 hrs (with 90% confidence level).	Calculated MTBF 220,000 hrs with fan (MIL HDBK 217F formula). Demonstrated MTBF 150,000 hrs with 90% confidence.	Calculated MTBF 662,000 hrs with fan (Bellcore formula). Demonstrated MTBF 150,000 hrs with 90% confidence.
EMI and EMC Compliance	• FCC Part 15 (CFR 47) Class A • ICES-003 Class A • EN 55022 Class A • CISPR 22 Class A • AS/NZS 3548 Class A • VCCI Class A • EN 55024 • EN300 386 • EN 50082-1 • EN 61000-3-2 • EN 61000-3-3 • EN 61000-6-1 • NEBS Compliant (Except C3K-PWR-1150WAC and C3K-PWR-750WAC)		
Safety Compliance	• UL 60950-1 1st Edition • CAN/CSA-C22.2 No. 60950-1 1st Edition • EN 60950-1 1st Edition • IEC 60950-1 1st Edition		
LED Indicators	• “AC OK” or “DC IN”: Input power to the power supply is OK. • “PS OK”: Output power from the power supply is OK.	• “AC OK”: Input power to the power supply is OK. • “PS OK”: Output power from the power supply is OK.	

Table 7 lists the safety and compliance information for the Cisco Catalyst 3560-E Series.

Table 7. Safety and Compliance

Description	Specification
Safety Certifications	• UL60950-1 • C-UL to CAN/CSA 22.2 No.60950-1 • TUV/GS to EN 60950-1 • CB to IEC 60950-1 with all country deviations • CE Marking • CCC for PS FRU
Electromagnetic Emissions Certifications	• FCC Part 15 Class A • EN 55022 Class A (CISPR22 Class A) • CNS13438 Class A (applicable only to FRU power supplies) • AS/NZS CISPR22 Class A • EN55024 • GR-1089 CORE Class A • EN 300 368 • MIC • CE Marking • China (applicable only to FRU power supplies)
NEBS	• GR-63-CORE, GR-1089-CORE • Level 3 Type 2, 4 and Wall Mount • AT&T TP76200 Checklist • TCG NEBS Checklist

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ETSI	EN 300 019 - Storage: Class 1.2, Transportation: Class 2.3, In-Use: Class 3.2
Environmental	Reduction of Hazardous Substances (ROHS) 5
Noise Specifications	Office Product Spec: 48dBA at 30℃ (refer to ISO 7779)
Telco	CLEI code
Warranty	Standard 90 Day Limited Hardware and Software Warranty

Hardware Warranty

Cisco Catalyst 3560-E Series Switches come with the standard Cisco 90-day limited warranty for hardware and software, as described at: http://www.cisco.com/en/US/products/prod_warranties_item09186a00805f005b.html.

Cisco Services for Access Switching

Cisco and our partners can help you create a robust, dependable Cisco Access Switching solution. The Cisco lifecycle approach to services defines the requisite activities at each phase of the solution lifecycle. Assessments help align your solution to business goals and gauge readiness to support new technology. Effective planning and design expedite solution adoption. Award-winning technical support increases operational efficiency, and optimization improves performance, resiliency, stability, and predictability and prepares your network and teams for change. For more information, visit http://www.cisco.com/go/services.

Ordering Information

Table 8 lists ordering information for the Cisco Catalyst 3560-E Series. To place an order, visit the Cisco ordering homepage at http://www.cisco.com/en/US/ordering/or13/or8/order_customer_help_how_to_order_listing.html.

Table 8. Cisco Catalyst 3560-E Series Ordering Info

Product Number	Product Description
Cisco Catalyst 3560-E Series	
WS-C3560E-24TD-S	• 24 10/100/1000 ports + 2 X2-based 10 Gigabit Ethernet ports • 128-Gbps wire rate, nonblocking switching fabric capacity • Field-replaceable 265WAC power supply and fan tray • 1 rack unit (RU) fixed configuration multilayer switch • IPv6 • IP Base software feature set (IPB)
WS-C3560E-24TD-E	• 24 10/100/1000 ports + 2 X2-based 10 Gigabit Ethernet ports • 128-Gbps wire rate, nonblocking switching fabric capacity • Field-replaceable 265WAC power supply and fan tray • 1-RU fixed configuration multilayer switch • IPv6 • IP Services software feature set (IPS) • Provides full IPv6 dynamic routing
WS-C3560E-48TD-S	• 48 10/100/1000 ports + 2 X2-based 10 Gigabit Ethernet ports • 128-Gbps wire rate, nonblocking switching fabric capacity • Field-replaceable 265WAC power supply and fan tray • 1-RU fixed configuration multilayer switch • IPv6 • IP Base software feature set (IPB)

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WS-C3560E-48TD-E	• 48 10/100/1000 ports + 2 X2-based 10 Gigabit Ethernet ports • 128-Gbps wire rate, nonblocking switching fabric capacity • Field-replaceable 265WAC power supply and fan tray • 1-RU fixed configuration multilayer switch • IPv6 • IP Services software feature set (IPS) • Provides full IPv6 dynamic routing
WS-C3560E-24PD-S	• 24 10/100/1000 PoE ports + 2 X2-based 10 Gigabit Ethernet ports • 128-Gbps wire rate, nonblocking switching fabric capacity • Field-replaceable 750WAC power supply and fan tray • 420W available for Enhanced PoE, allowing > 15.4W to all 24 ports • 1-RU fixed configuration multilayer switch • IPv6 • IP Base software feature set (IPB)
WS-C3560E-24PD-E	• 24 10/100/1000 PoE ports + 2 X2-based 10 Gigabit Ethernet ports • 128-Gbps wire rate, nonblocking switching fabric capacity • Field-replaceable 750WAC power supply and fan tray • 420W available for Enhanced PoE, allowing > 15.4W to all 24 ports • 1-RU fixed configuration multilayer switch • IPv6 • IP Services software feature set (IPS) • Provides full IPv6 dynamic routing
WS-C3560E-48PD-S	• 48 10/100/1000 PoE ports + 2 X2-based 10 Gigabit Ethernet ports • 128-Gbps wire rate, nonblocking switching fabric capacity • Field-replaceable 750WAC power supply and fan tray • 420W available for Enhanced PoE allowing > 15.4W for up to 24 ports • 1-RU fixed configuration multilayer switch • IPv6 • IP Base software feature set (IPB)
WS-C3560E-48PD-E	• 48 10/100/1000 PoE ports + 2 X2-based 10 Gigabit Ethernet ports • 128-Gbps wire rate, nonblocking switching fabric capacity • Field-replaceable 750WAC power supply and fan tray • 420W available for Enhanced PoE allowing > 15.4W for up to 24 ports • 1-RU fixed configuration multilayer switch • IPv6 • IP Services software feature set (IPS) • Provides full IPv6 dynamic routing
WS-C3560E-48PD-SF	• 48 10/100/1000 PoE ports + 2 X2-based 10 Gigabit Ethernet ports • 128-Gbps wire rate, nonblocking switching fabric capacity • Field-replaceable 1150WAC power supply and fan tray • 800W available for Enhanced PoE, allowing > 15.4W to all 48 ports • 1-RU fixed configuration multilayer switch • IPv6 • IP Base software feature set (IPB)
WS-C3560E-48PD-EF	• 48 10/100/1000 PoE ports + 2 X2-based 10 Gigabit Ethernet ports • 128-Gbps wire rate, nonblocking switching fabric capacity • Field-replaceable 1150WAC power supply and fan tray • 800W available for Enhanced PoE, allowing > 15.4W to all 48 ports • 1-RU fixed configuration multilayer switch • IPv6 • IP Services software feature set (IPS) • Provides full IPv6 dynamic routing
WS-C3560E-12D-S	• 12 X2-based 10 Gigabit Ethernet ports • 60 Gbps, backplane utilization 2:1 oversubscribed • Dual hot-swappable 300WAC or DC power supplies and redundant fans • 1-RU fixed configuration multilayer switch • IPv6 • IP Base software feature set (IPB)

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WS-C3560E-12D-E	• 12 X2-based 10 Gigabit Ethernet ports • 60 Gbps, backplane utilization 2:1 oversubscribed • Dual hot-swappable 300WAC or DC power supplies and redundant fans • 1-RU fixed configuration multilayer switch • IPv6 • IP Services software feature set (IPS) • Provides full IPv6 dynamic routing
WS-C3560E-12SD-S	• 12 SFP based Gigabit Ethernet ports + 2 X2-based 10 Gigabit Ethernet ports • 68 Gbps, wire rate backplane • Dual hot-swappable 300WAC or DC power supplies and redundant field-replaceable fans • 1-RU fixed configuration multilayer switch • IPv6 • IP Base software feature set (IPB)
WS-C3560E-12SD-E	• 12 SFP based Gigabit Ethernet ports + 2 X2-based 10 Gigabit Ethernet ports • 68 Gbps, wire rate backplane • Dual hot-swappable 300WAC or DC power supplies and redundant field-replaceable fans • 1-RU fixed configuration multilayer switch • IPv6 • IP Services software feature set (IPS) • Provides full IPv6 dynamic routing
Cisco Catalyst 3560-E Series Product Activation Keys	
3560E-LIC=	
Cisco Catalyst 3560-E Series Product Activation Keys Configurations	
3560E-IPSLCB-QTY	IP Services for 3560-E, upgrade from the IP Base Feature Set
3560E12D-SLB-QTY	IP Services for 3560E-12D, upgrade from IP Base
3560E12SD-SLB-QTY	IP Services for 3560E-12SD, upgrade from IP Base
Power Supplies and Fan Module for the Cisco Catalyst 3560-E Series	
C3K-PWR-265WAC=	Catalyst 3750-E/3560-E 265WAC power supply
C3K-PWR-265WDC=	Catalyst 3750-E/3560-E 265WDC power supply
C3K-PWR-750WAC=	Catalyst 3750-E/3560-E/RPS 2300 750WAC power supply
C3K-PWR-1150WAC=	Catalyst 3750-E/3560-E/RPS 2300 1150WAC power supply
C3K-BLWR-60CFM=	Fan Module for the Catalyst 3750-E/3560-E
Power Supplies and Fan Module for the Cisco Catalyst 3560E-12D and Catalyst 3560E-12SD Aggregation Switches	
C3K-PWR-300WAC=	Catalyst 3560E-12D and Catalyst 3560E-12SD 300WAC power supply spare
C3K-PWR-300WDC=	Catalyst 3560E-12D and Catalyst 3560E-12SD 300WDC power supply spare
C3K-FAN-16CFM=	Fan Module for the Catalyst 3560E-12D and Catalyst 3560E-12SD
Redundant Power System for the Cisco Catalyst 3560-E Series	
PWR-RPS2300	Cisco Redundant Power System 2300 and Blower,No Power Supply
ACC-RPS2300=	Spare Accessory Kit for Cisco Redundant Power System 2300
BLNK-RPS2300=	Spare Bay Insert for Cisco Redundant Power System 2300
CAB-RPS2300=	Spare RPS2300 Cable for Devices other than E-Series Switches
CAB-RPS2300-E=	Spare RPS2300 Cable for Catalyst 3750E/3560E Switches
PWR-RPS2300=	Spare RPS 2300 Chassis w/ Blower, PS blank, No Power Supply
BLWR-RPS2300=	Spare 45CFM Blower for Cisco Redundant Power System 2300
C3K-PWR-750WAC=	Catalyst 3750-E/3560-E/RPS 2300 750WAC power supply spare
C3K-PWR-1150WAC=	Catalyst 3750-E/3560-E/RPS 2300 1150WAC power supply spare
TwinGig Converter Module for the Cisco Catalyst 3560-E Series	
CVR-X2-SFP	TwinGig Converter Module
CVR-X2-SFP=	TwinGig Converter Module

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SFPs for the Cisco Catalyst 3560-E Series	
GLC-GE-100FX=	100BASE-FX SFP for GE SFP port on 3750,3560.2970,2960
GLC-LH-SM=	GE SFP,LC connector LX/LH transceiver
GLC-SX-MM=	GE SFP, LC connector SX transceiver
GLC-T=	1000BASE-T SFP
GLC-ZX-SM=	1000BASE-ZX SFP
GLC-BX-D=	1000BASE-BX SFP, 1490NM
GLC-BX-U=	1000BASE-BX SFP, 1310NM
CWDM-SFP-1470=	CWDM 1470 NM SFP Gigabit Ethernet and 1G/2G FC
CWDM-SFP-1490=	CWDM 1490 NM SFP Gigabit Ethernet and 1G/2G FC
CWDM-SFP-1510=	CWDM 1510 NM SFP Gigabit Ethernet and 1G/2G FC
CWDM-SFP-1530=	CWDM 1530 NM SFP Gigabit Ethernet and 1G/2G FC
CWDM-SFP-1550=	CWDM 1550 NM SFP Gigabit Ethernet and 1G/2G FC
CWDM-SFP-1570=	CWDM 1570 NM SFP Gigabit Ethernet and 1G/2G FC
CWDM-SFP-1590=	CWDM 1590 NM SFP Gigabit Ethernet and 1G/2G FC
CWDM-SFP-1610=	CWDM 1610 NM SFP Gigabit Ethernet and 1G/2G FC
DWDM SFPs for Cisco Catalyst 3560-E Series (not currently supported with the Cisco Catalyst 3560E-12D & Catalyst 3560E-12SD)	
DWDM-SFP-3033=	DWDM SFP 1530.33 nm SFP (100 GHz ITU grid)
DWDM-SFP-3112=	1000BASE-DWDM 1531.12 nm SFP (100 GHz ITU grid)
DWDM-SFP-3190=	1000BASE-DWDM 1531.90 nm SFP (100 GHz ITU grid)
DWDM-SFP-3268=	DWDM SFP 1532.68 nm SFP (100 GHz ITU grid)
DWDM-SFP-3425=	DWDM SFP 1534.25 nm SFP (100 GHz ITU grid)
DWDM-SFP-3504=	DWDM SFP 1535.04 nm SFP (100 GHz ITU grid)
DWDM-SFP-3582=	DWDM SFP 1535.82 nm SFP (100 GHz ITU grid)
DWDM-SFP-3661=	DWDM SFP 1536.61 nm SFP (100 GHz ITU grid)
DWDM-SFP-3819=	DWDM SFP 1538.19 nm SFP (100 GHz ITU grid)
DWDM-SFP-3898=	DWDM SFP 1538.98 nm SFP (100 GHz ITU grid)
DWDM-SFP-3977=	DWDM SFP 1539.77 nm SFP (100 GHz ITU grid)
DWDM-SFP-4056=	DWDM SFP 1540.56 nm SFP (100 GHz ITU grid)
DWDM-SFP-4214=	DWDM SFP 1542.14 nm SFP (100 GHz ITU grid)
DWDM-SFP-4294=	DWDM SFP 1542.94 nm SFP (100 GHz ITU grid)
DWDM-SFP-4373=	DWDM SFP 1543.73 nm SFP (100 GHz ITU grid)
DWDM-SFP-4453=	DWDM SFP 1544.53 nm SFP (100 GHz ITU grid)
10GB X2 Module for Cisco Catalyst 3560-E Series	
X2-10GB-ER=	10GBASE-ER X2 Module
X2-10GB-LR=	10GBASE-LR X2 Module
X2-10GB-SR=	10GBASE-SR X2 Module
X2-10GB-LRM=	10GBASE-LRM X2 Module
X2-10GB-LX4=	10GBASE-LX4 X2 Module
X2-10GB-CX4=	10GBASE-CX4 X2 Module
LC to SC Cables for the Cisco Catalyst 3560-E Series	
CSS5-CABLX-LCSC=	CSS11500 10-Meter Fiber Single Mode LX LC-to-SC Connectors
CSS5-CABSX-LC=	CSS11500 10-Meter Fiber Multimode SX LC Connectors
CSS5-CABSX-LCSC=	CSS11500 10-Meter Fiber Multimode SX LC-to-SC Connectors
Spare Power Cords for the Cisco Catalyst 3560-E Series	
CAB-AC=	Power Cord, 110V

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CAB-16AWG-AC=	AC Power cord, 16AWG
CAB-ACA=	Plug, Power Cord, Australian, 10A
CAB-ACE=	Power Cord Europe
CAB-ACI=	Power Cord-Italian
CAB-ACR=	Power Cord Argentina
CAB-ACS=	Power Cord for Switzerland
CAB-ACU=	Power Cord UK
CAB-JPN=	Power Cord-Japan
CAB-L620P-C13-US=	Power Cord, 250VAC, 15A, NEMA L6-20 to C13, US
CAB-L620P-C13-JPN=	Power Cord, 250VAC, 15A, NEMA L6-20 to C13, JAPAN
CAB-IND=	Power Cord India
CAB-C13-C14-AC	Power Cord with C14 connector
CAB-SFP-50CM=	Catalyst 3560-E SFP Interconnect Cable, 50cm
Spare Rack Mount Kits for the Cisco Catalyst 3560-E Series	
RCKMNT-E-1RU=	Rack Mount Kit (1RU) for Catalyst 3750-E and 3560-E
Cisco Catalyst 3560-E Relicensing for Used Equipment	
LL-3560E-IPB=	IP Base SW Feature set license for Catalyst 3560-E Series
LL-3560E-IPS=	IP Services SW Feature set license for Catalyst 3560-E Series
Software Application Support Plus Upgrades Technical Services Contract	
Product Part Number	**Service Contract Number**
3560E-AISK9-LIC-B	Catalyst 3560-E AIS Upgrade from IP Base
3560E-AISK9-LIC-S	Catalyst 3560-E AIS Upgrade from IP Svcs
3560E-IPS-LIC-B	Catalyst 3560-E IPS Upgrade from IP Base
3560E12D-SLB-QTY	IP Services for 3560E-12D, upgrade from IP Base
3560E12SD-SLB-QTY	IP Services for 3560E-12SD, upgrade from IP Base

For More Information

For more information about the Cisco Catalyst 3560-E Series Switches, visit: http://www.cisco.com/en/US/products/hw/switches/index.html or contact your local account representative.

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